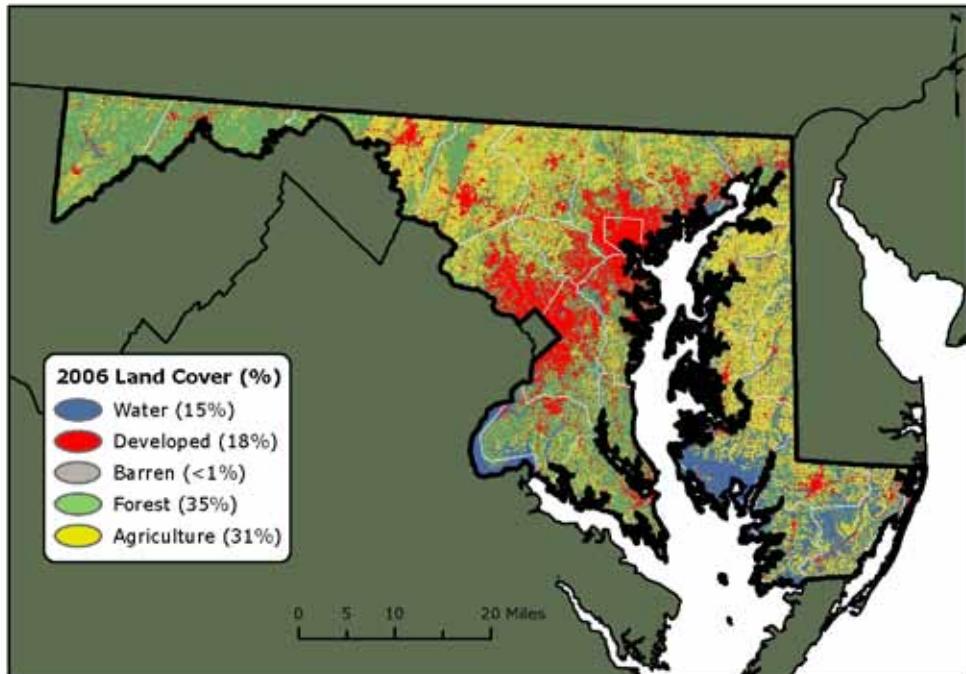


2012 Forest Health MARYLAND *highlights*



The Resource

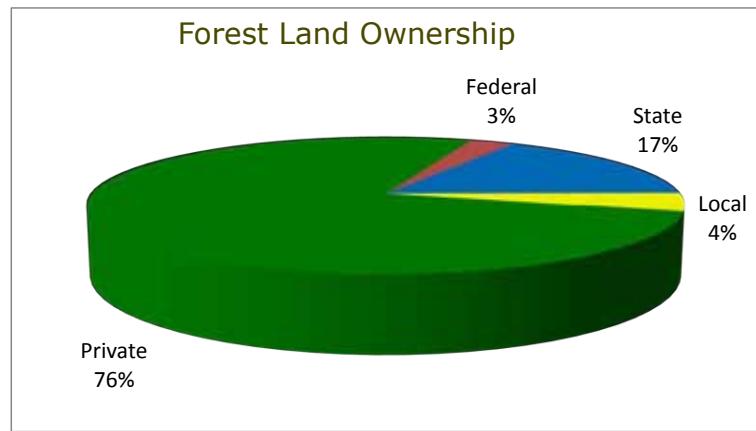
Maryland occupies a land area of 6,255,800 acres. Forest land comprises 2,565,800 acres, of which nearly 76 percent is privately owned. Healthy, productive forests are critical in urban and rural areas for soil conservation, clean air and water, wildlife habitat, outdoor recreation, and aesthetics. The forest products industry is the largest employer in Allegany and Garrett Counties and the second largest employer on the Eastern Shore.



Forest Health Monitoring

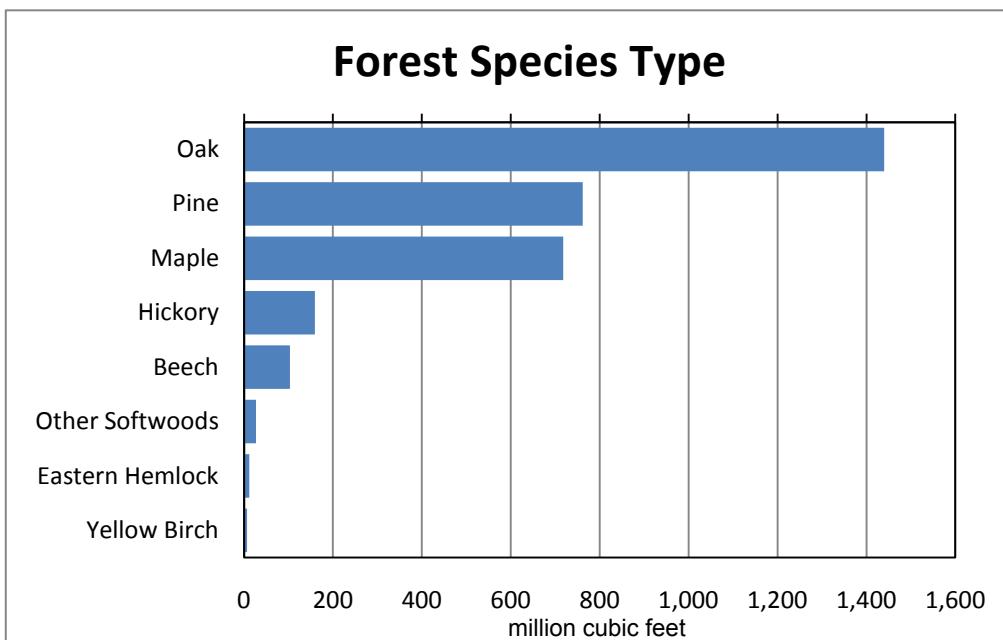
The national Forest Health Monitoring (FHM) Program has two components: plot network and off-plot survey. The U.S. Forest Service Northern Research Station's Forest Inventory and Analysis staff administers

(continued on page 2)



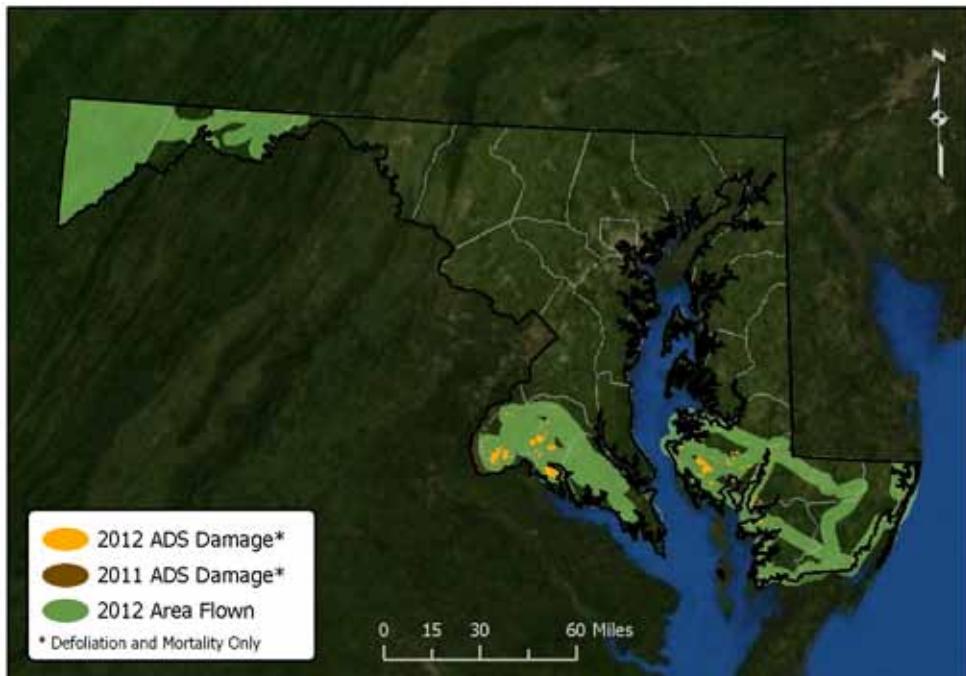
Forest Health Programs

State forestry agencies work in partnership with the U.S. Forest Service to monitor forest conditions and trends in their State and respond to pest outbreaks to protect the forest resource.



Aerial Surveys

Of the acreage flown in the 2012 aerial detection survey in Maryland, 40,453 acres of damage were recorded. The fall cankerworm caused the majority of this damage (21,551 acres). Saltwater from flooding and hurricanes damaged loblolly pine on 17,977 acres. Surveyors also recorded 740 acres of damage from oak decline and 148 acres of fire damage.



This map delineates aerial detection survey (ADS) results for Maryland in 2012 and 2011.

Forest Health Monitoring (continued from page 1)

the plot network in Maryland. The plot network is designed to annually monitor, assess, and report on changes in the long-term condition of trees, soils, lichens, and air quality in forests.

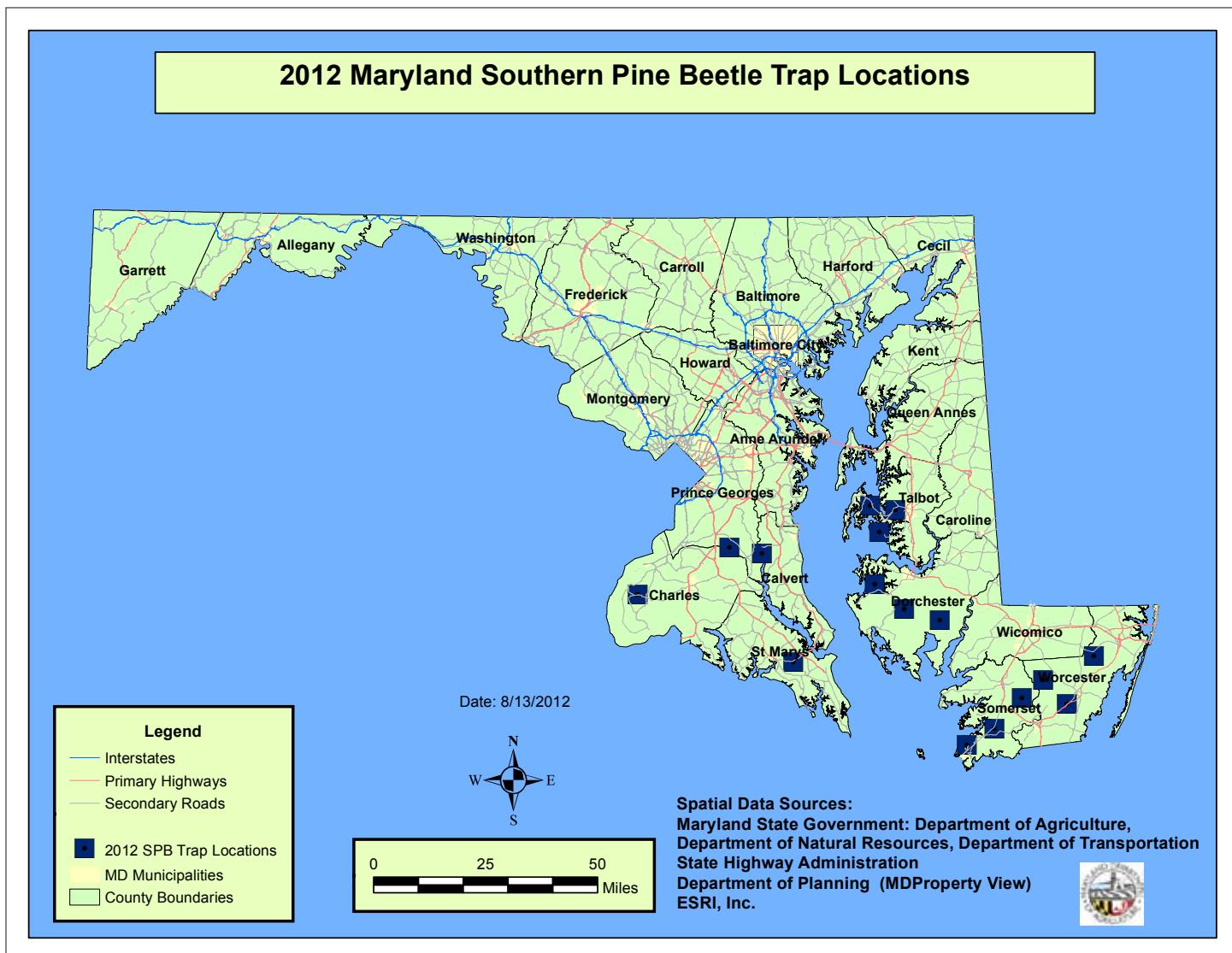
The Maryland Department of Agriculture conducts the off-plot survey component of FHM. The objectives of the [Maryland] FHM Program are to delimit, map, and report forest pest problems as a supplement to the national FHM plot network. Aerial and ground surveys, data collection, and reporting are conducted in accordance with FHM standards for air operations and GIS.

Office of Plant Industries and Pest Management

Forest Pest Management Section

Southern Pine Beetle (SPB)

The southern pine beetle (*Dendroctonus frontalis* Zimmerman) is one of the most destructive insect pests of pines. Maryland is at the northern edge of the SPB range, and this insect is commonly found on the lower Eastern Shore and in southern Maryland. Since 1989, Maryland has participated in a multistate SPB survey that is conducted throughout the Southern United States using pheromone-baited traps. Trap data indicated that SPB numbers would continue to remain low in 2012. Populations have been below outbreak levels since 1994. The three sites that were detected in 2010—two sites in Kent County and one in Talbot County—have collapsed.

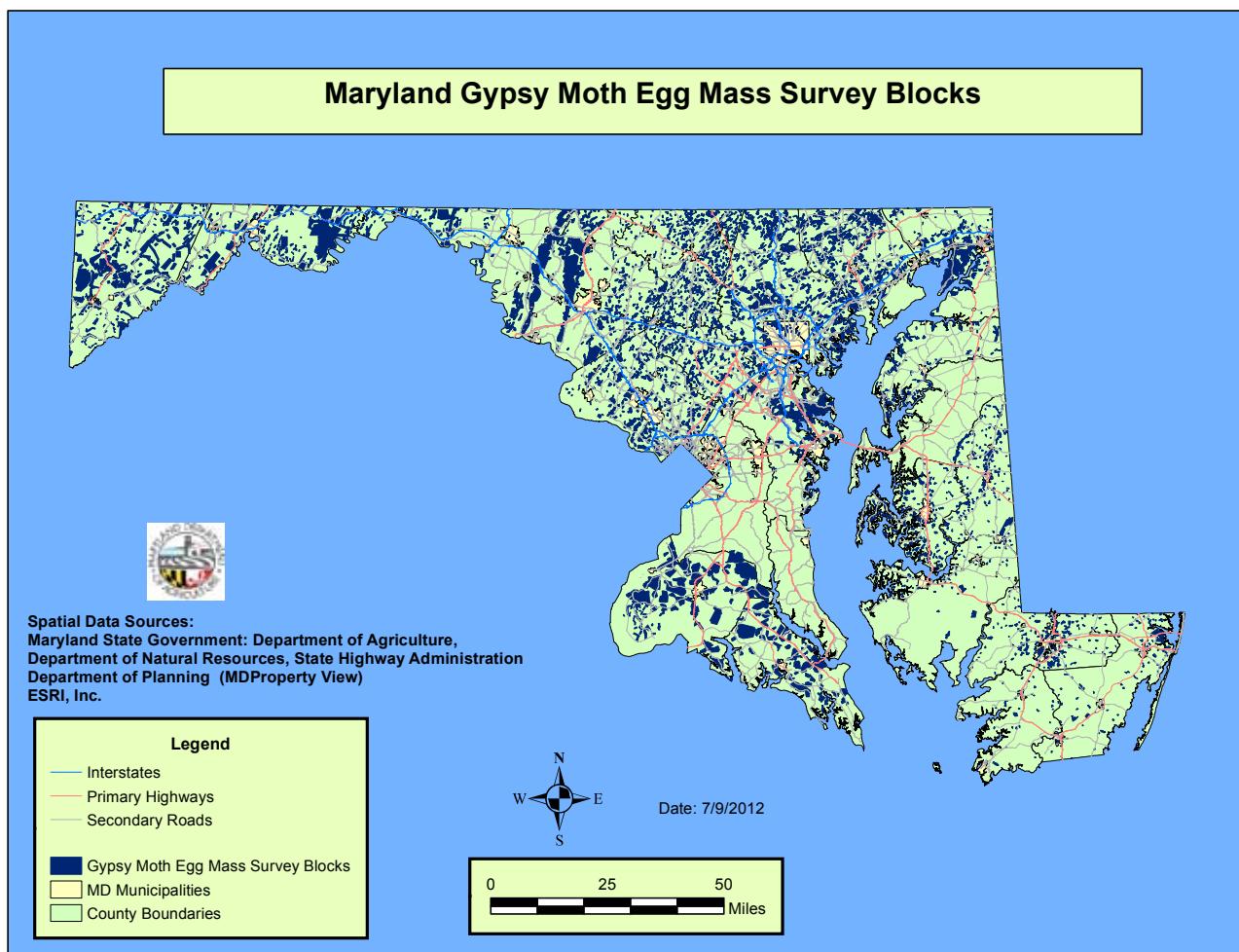


2012 Maryland Southern Pine Beetle Trap Locations.

Gypsy Moth

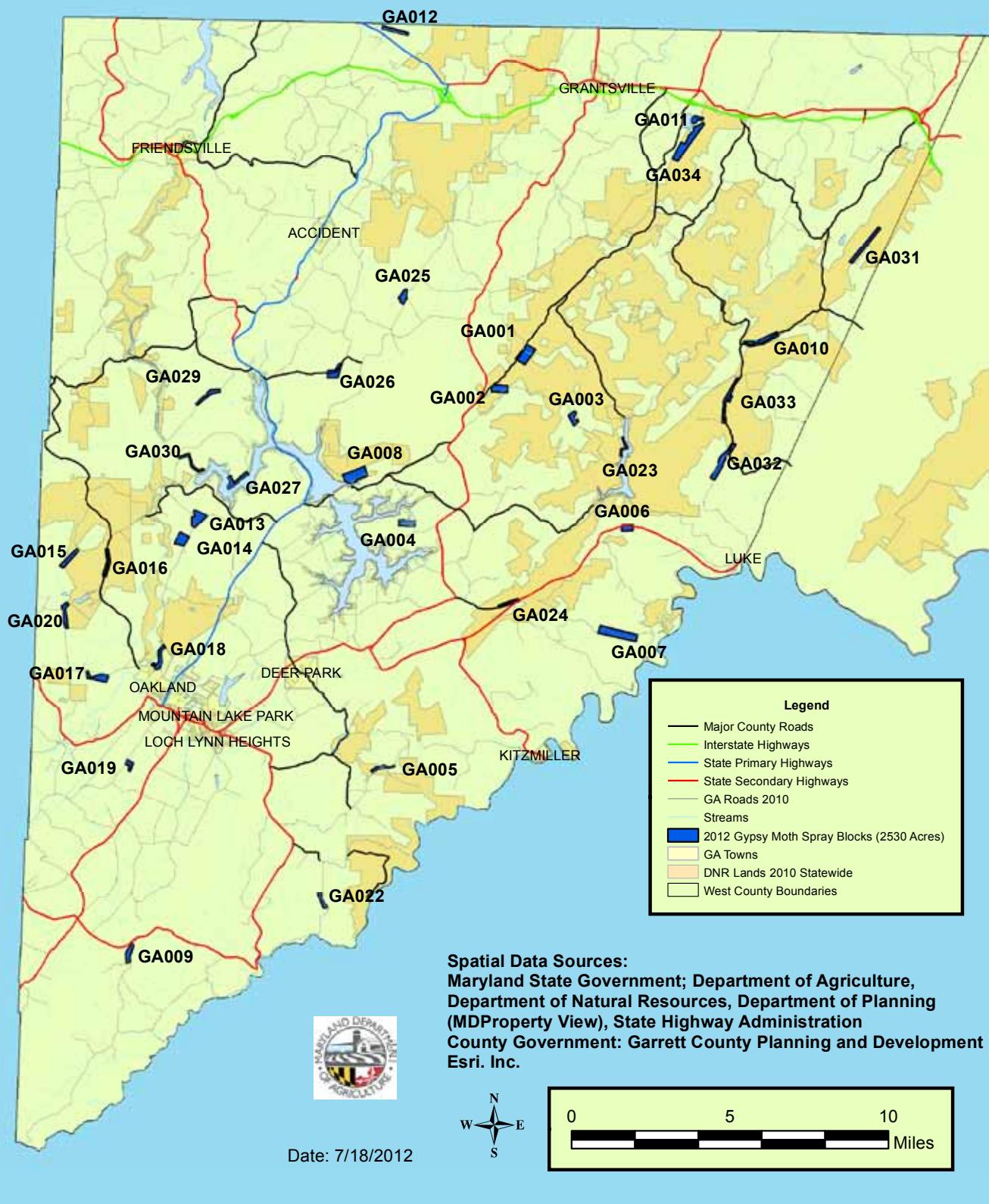
The gypsy moth (*Lymantria dispar* L.) is the most serious threat to oak forests in the United States. The first eggs were detected in Maryland in 1971, and the first extensive defoliation occurred in 1981. Each fall and winter, the Maryland Department of Agriculture (MDA) conducts an extensive survey for gypsy moth egg masses to determine potential areas of defoliation. From August 2011 through March 2012, MDA Forest Pest Management (MDA-FPM) personnel conducted gypsy moth egg mass surveys on 467,815 acres of "high-value" forested lands. "High-value" forested sites include areas with development, recreational use, managed forest and wildlife resources, and other site conditions that render dieback and mortality to be economically and socially important.

The survey results indicated that the current populations were sufficient to cause moderate to heavy defoliation on 985 acres of high-value rural and urban forest in 2012. These areas were part of the Cooperative Gypsy Moth Suppression Program and were eligible for U.S. Forest Service funding. In addition, 1,545 acres were treated. These additional areas had at least one survey point with 250 or more egg masses per acre, but the average for the area was less than 250 egg masses. These additional areas were not eligible for U.S. Forest Service funding. In 2012, Maryland sprayed a total of 2,530 acres in 32 spray blocks with the insecticide Foray 48B. All spray areas were in Garrett County. Aerial application of insecticide started May 16, and application continued for four straight days finishing on May 19.

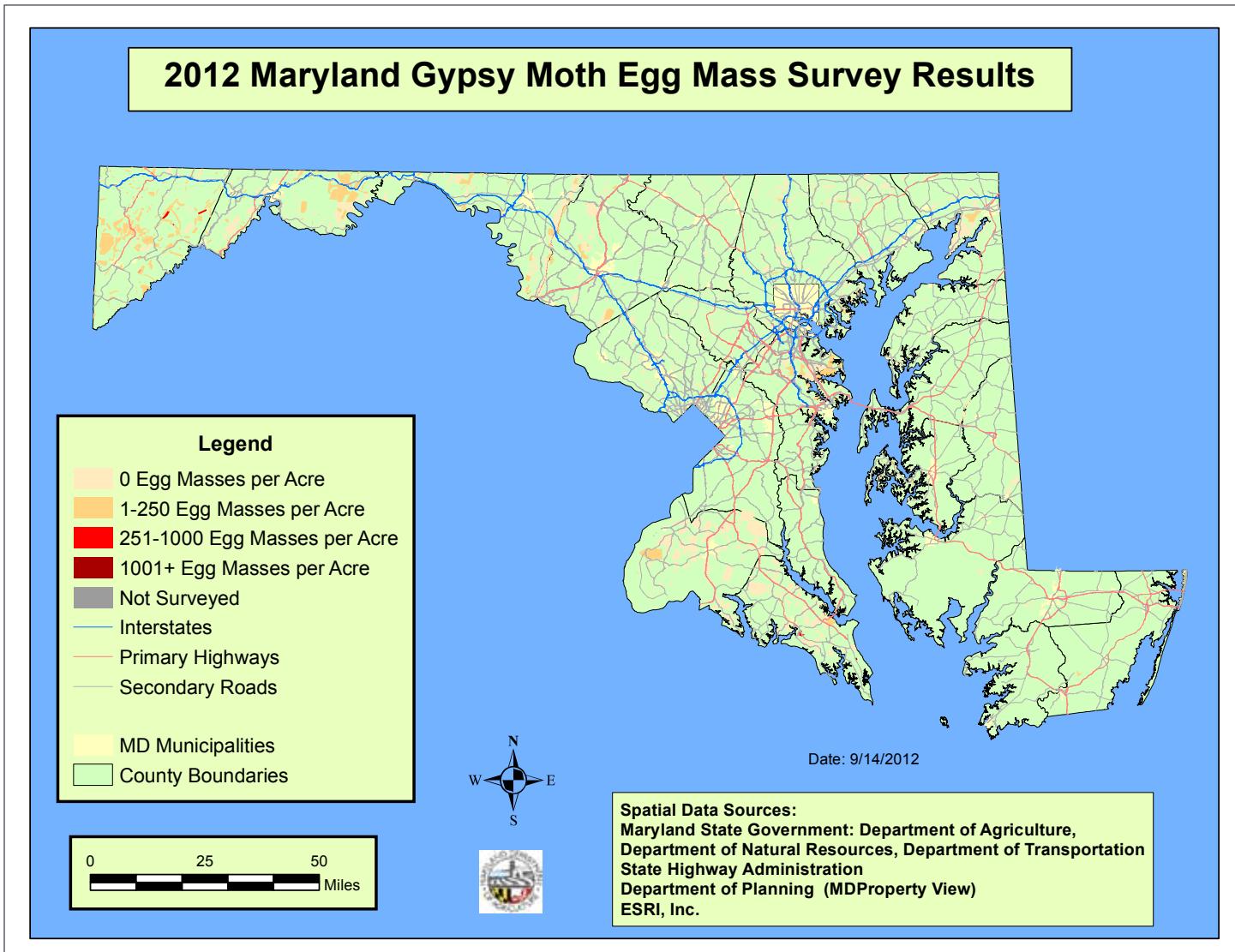


Maryland Gypsy Moth Egg Mass Survey Blocks.

2012 Gypsy Moth Spray Blocks Garrett County, Maryland



The map below depicts the results of the gypsy moth egg mass surveys.



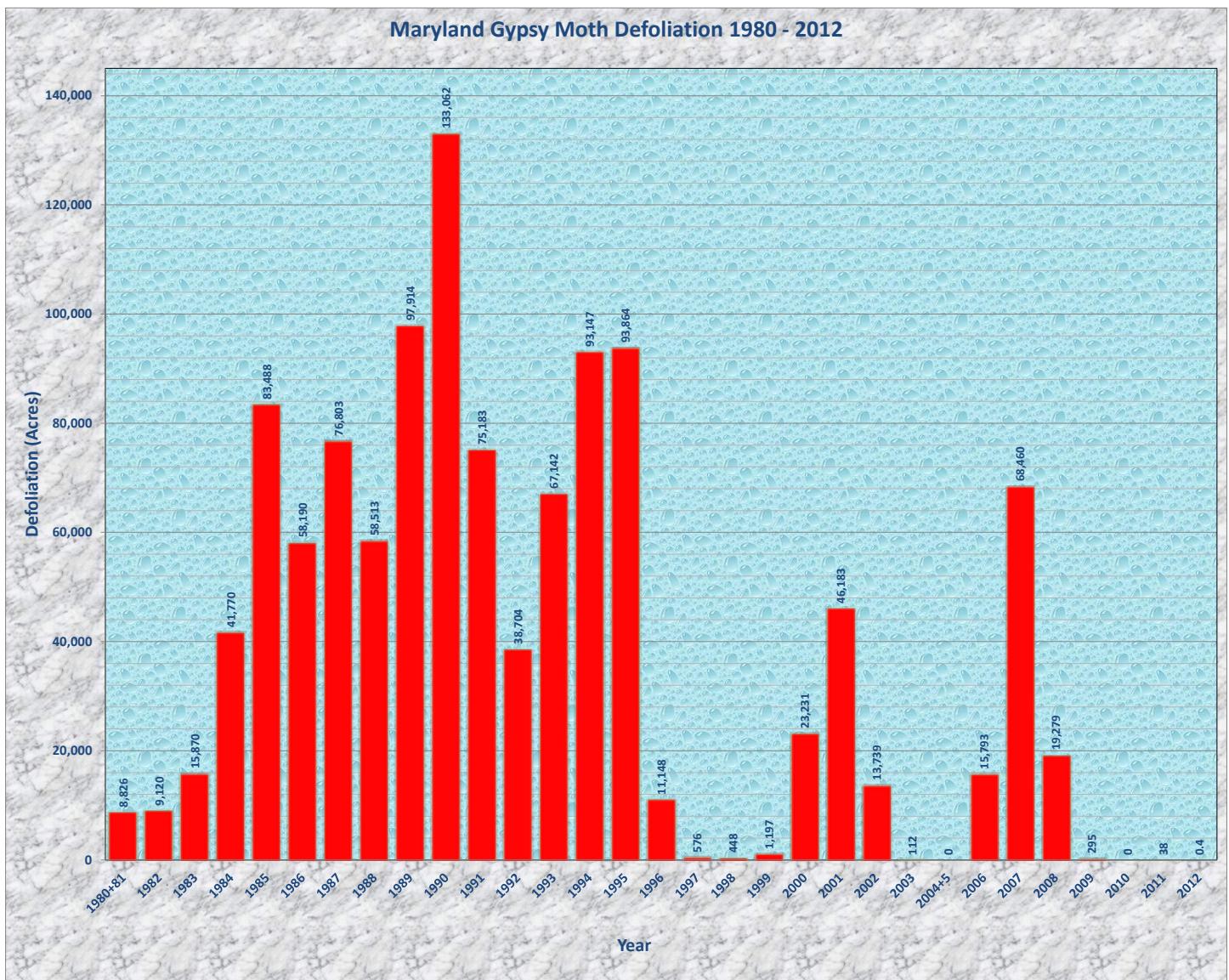
2012 Maryland Gypsy Moth Egg Mass Survey Results.

2011 - 2012 Maryland Gypsy Moth Egg Mass Survey Summary

County	Number of Blocks Surveyed	Number of Acres Surveyed	Number of Points Surveyed
Anne Arundel	80	25,818	314
Allegany	178	51,583	557
Baltimore	179	28,930	610
Baltimore City	1	120	3
Carroll	214	13,402	497
Cecil	92	24,339	425
Charles	58	79,411	209
Caroline	6	3,848	41
Dorchester	30	2,603	110
Frederick	61	25,957	382
Garrett	230	66,944	887
Harford	146	23,275	508
Howard	130	11,148	369
Kent	69	6,271	200
Montgomery	197	19,537	680
St. Mary's	52	39,086	122
Somerset	12	637	39
Talbot	46	4,032	160
Washington East	65	22,802	356
Wicomico	26	2,359	107
Worcester	34	2,316	122
Washington West	72	13,397	229
TOTAL	1,978	467,815	6,927

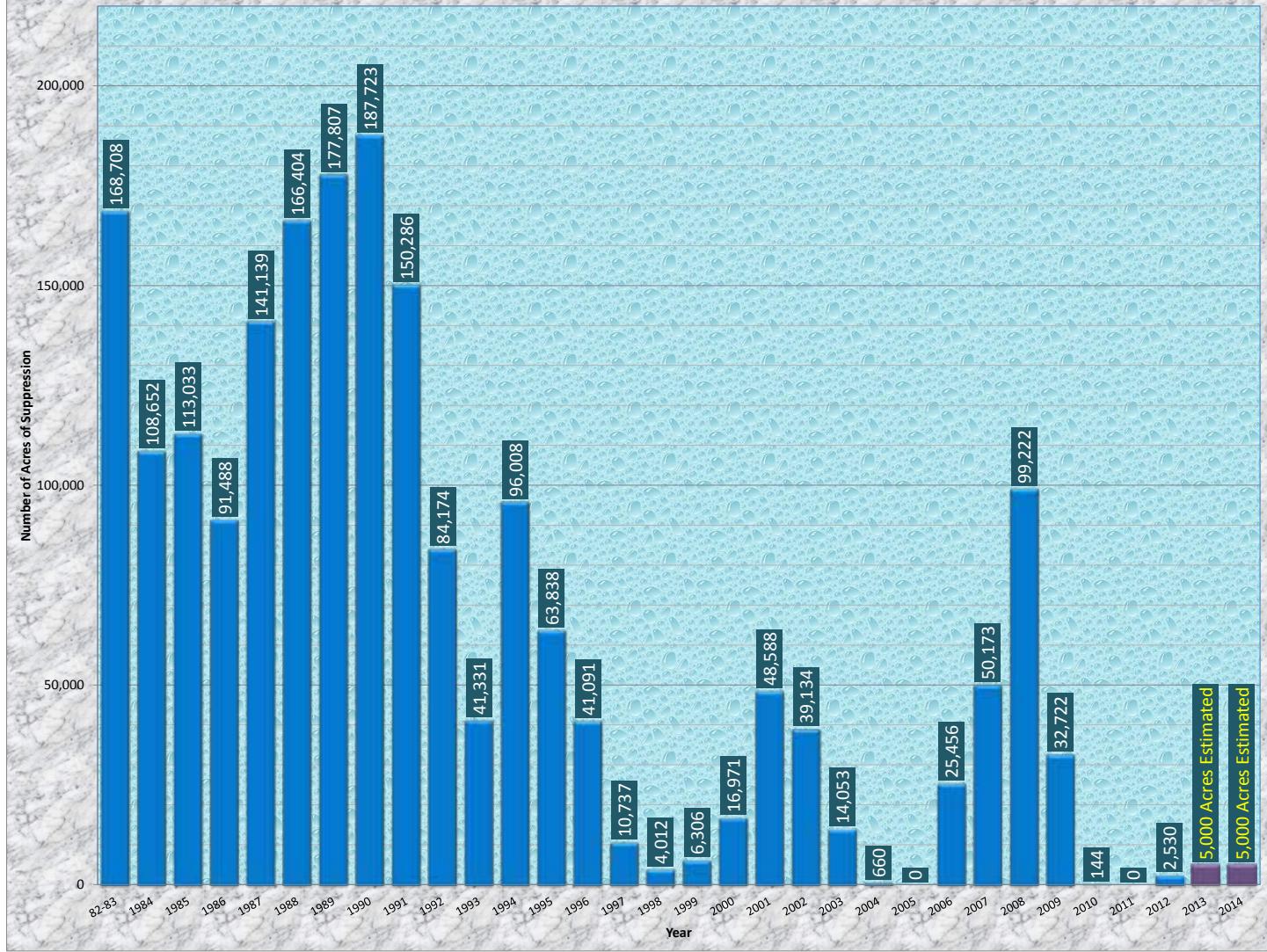
2011 – 2012 Maryland Gypsy Moth Egg Mass Survey Summary.

Historical Gypsy Moth Defoliation and Suppression



Maryland Gypsy Moth Defoliation 1980 – 2012.

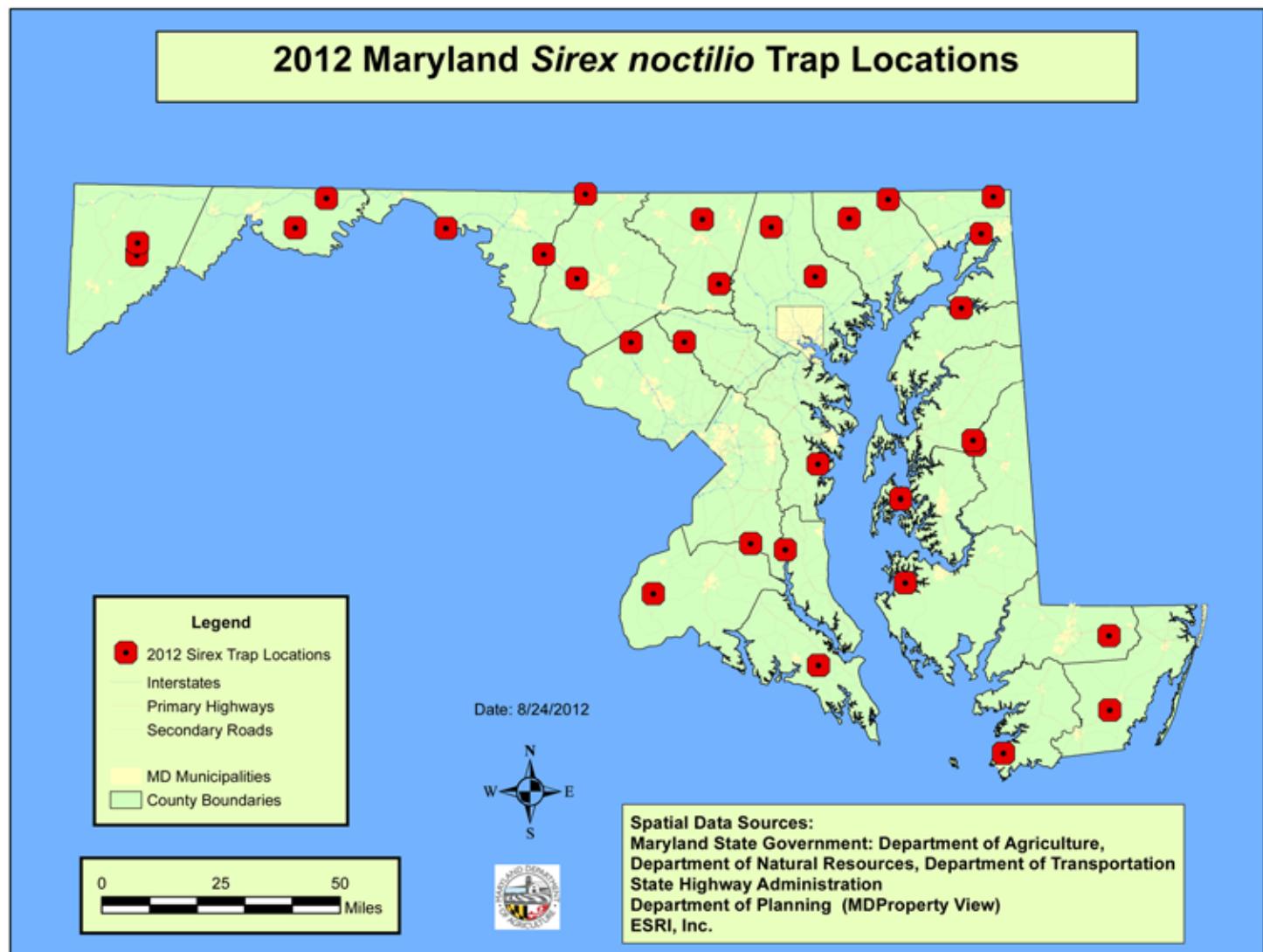
Maryland Gypsy Moth Suppression 1982 to 2014



Maryland Gypsy Moth Suppression 1982 to 2014.

Sirex Woodwasp

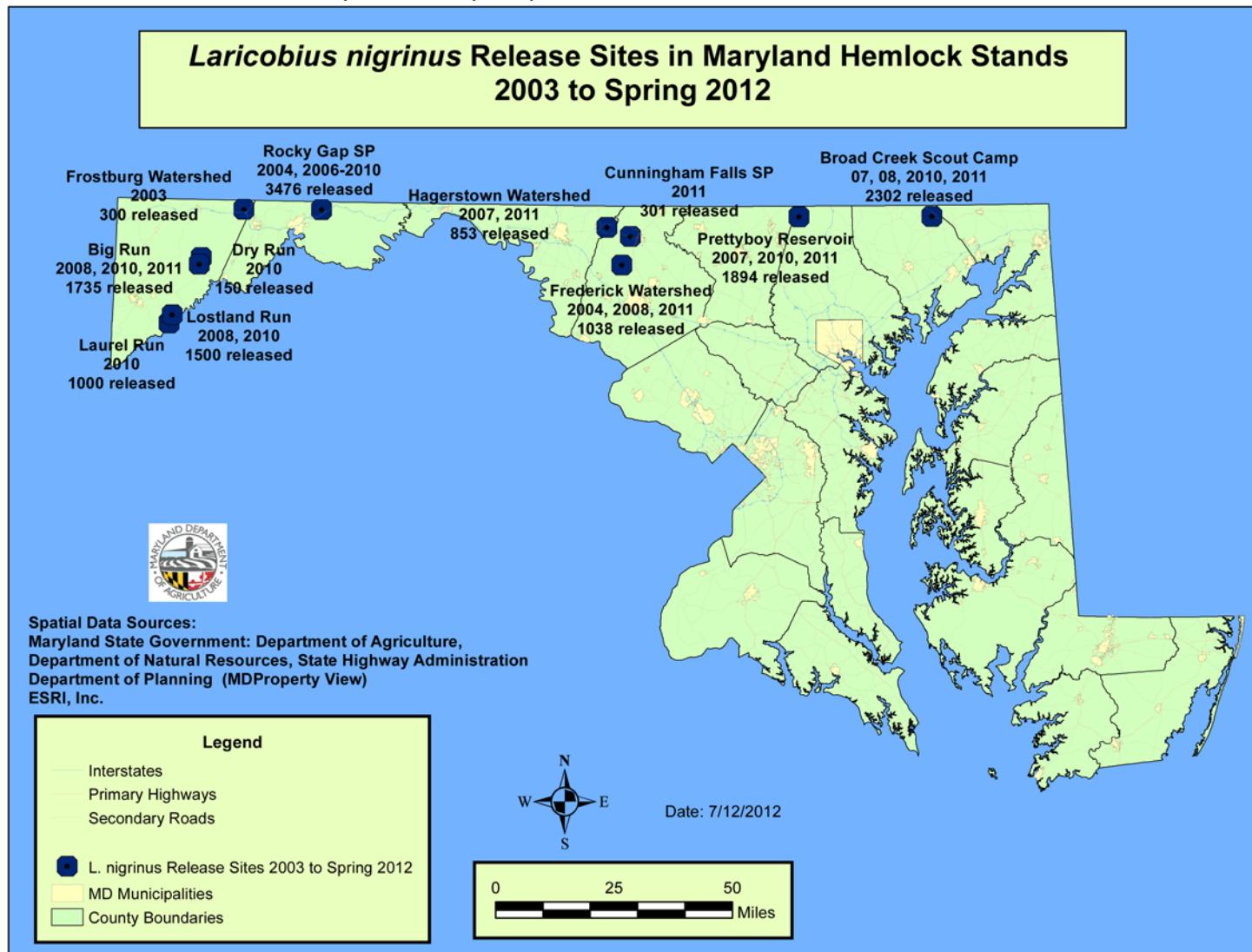
Sirex woodwasp (*Sirex noctilio*) has been the most common species of exotic woodwasp detected at United States ports-of-entry associated with solid-wood packing materials. Recent detections of this woodwasp outside of port areas in the United States have raised concerns because this insect has the potential to cause significant mortality of pines. The Sirex woodwasp has not been detected in Maryland but is known to be in Pennsylvania. To detect this insect, the MDA placed two traps per county in the northern tier counties and one trap for all other counties, for a total of 30 traps in pine woods. All traps were negative during FY2012.



2012 Maryland Sirex noctilio Trap Locations.

Hemlock Woolly Adelgid (HWA)

Hemlock woolly adelgid (*Adelges tsugae* Annand) remains the major threat to the health of eastern hemlock. Infested hemlocks occur in the metropolitan area between Baltimore and Washington and in natural stands from Harford to Garrett Counties. *Laricobius nigrinus*, a predatory beetle of the hemlock woolly adelgid, has been released in several areas since 2004. In FY2012, the MDA released 685 beetles in four areas of Garrett County, 302 beetles in Harford County, 304 beetles in Baltimore County, 962 beetles in Frederick County, and 353 beetles in Washington County for a total of 2,606 beetles released. Fourteen hundred of these beetles were collected from our "nursery" in Rocky Gap State Park.



Laricobius nigrinus Release Sites in Maryland Hemlock Stands 2003 to Spring 2012.

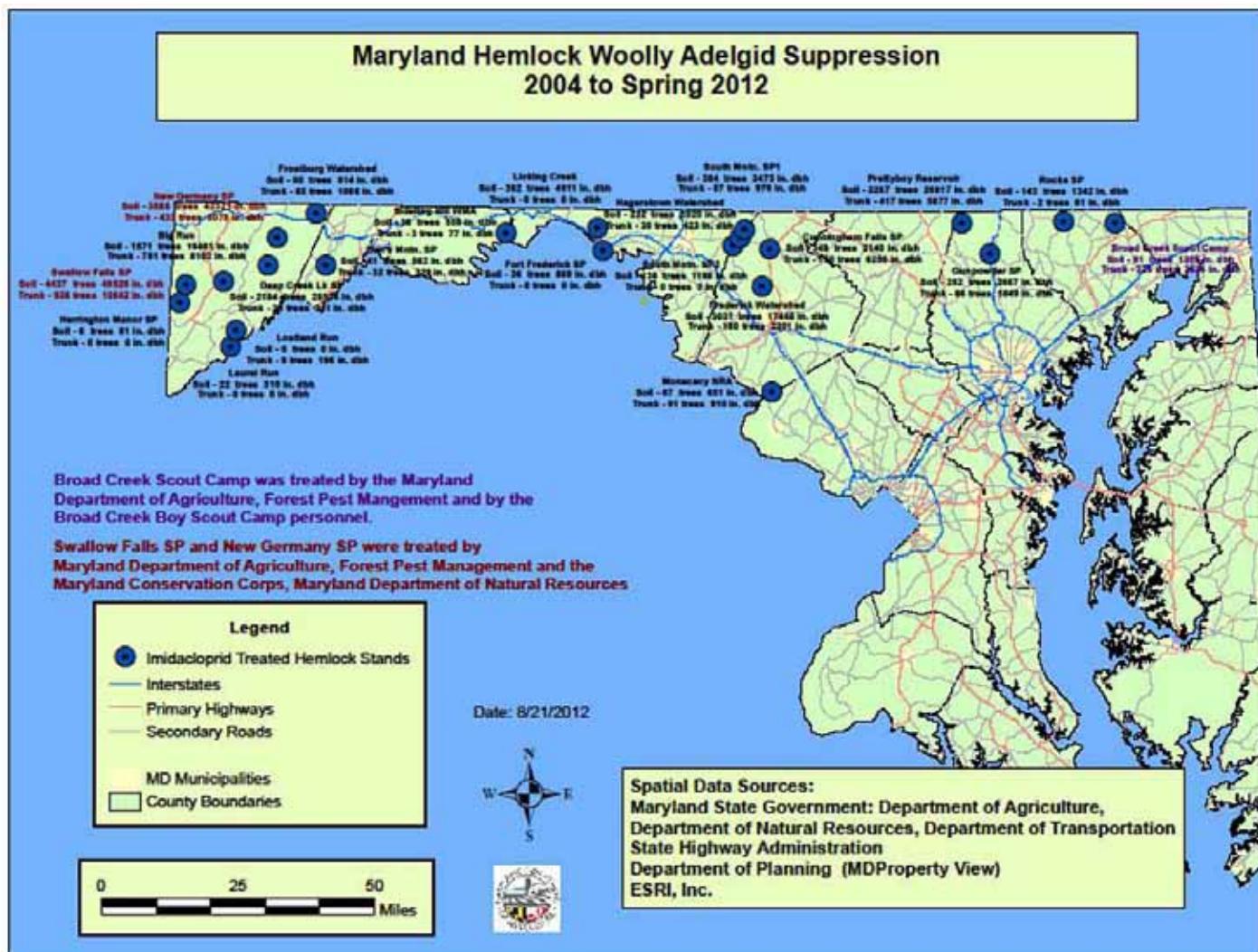
Fall 2011 Laricobius nigrinus Releases in Maryland for Hemlock Woolly Adelgid Control

County	Hemlock Stand	Number Released
Baltimore	Prettyboy Reservoir	304
Harford	Broad Creek Scout Camp	302
Frederick	Cunningham Falls SP	301
Frederick	Frederick City Watershed	661
Washington	Hagerstown Watershed	353
Garrett	Savage River SF (Big Run)	685
Total		2606

Fall 2011 Laricobius nigrinus Releases in Maryland for Hemlock Woolly Adelgid Control.

Hemlock Woolly Adelgid: Suppression

A joint task force of the MDA and the Maryland Department of Natural Resources (MDNR) addressed the multidisciplinary needs of managing the HWA infestation. The task force prioritized more than 50 hemlock stands and selected them as the sites where suppression might be attempted using the insecticide imidacloprid. Only publicly owned sites would be part of this suppression project. MDA-FPM, in conjunction with Boy Scout volunteers, treated 96 trees by trunk injection and 81 trees by soil injection. MDA-FPM worked with the MDNR-Park Service to treat 495 trees by trunk injection and 5,107 trees by soil injection. MDA-FPM staff alone treated 1,115 trees by trunk injection and 2,606 trees by soil injection.



Maryland Hemlock Woolly Adelgid Suppression 2004 to Spring 2012.

Fall 2011 - Spring 2012 Imidacloprid Treatments for Hemlock Woolly Adelgid in Maryland							
		Trunk Injection	Trunk Injection	Soil Injection	Soil Injection	Total	Total
Hemlock Stand	County	#Trees	Inches DBH*	#Trees	Inches DBH*	#Trees	Inches DBH*
Savage River SF (Big Run)	Garrett	324	2,867	516	4,974	840	7,840
Cunningham Falls SP	Frederick	346	2,560	56	435	402	2,995
Frederick Watershed	Frederick	75	665	492	3,023	567	3,688
Broad Creek***	Harford	96	1,087	81	1,309	177	2,396
Rocks SP	Harford	-	0	14	219	14	219
Frostburg Watershed	Garrett	85	1,066	0	0	85	1,066
Prettyboy Reservoir	Baltimore	92	1,181	83	1,537	175	2,718
Deep Creek Lake SP	Garrett	-	0	1,346	17,092	1,346	17,092
Swallow Falls SP**	Garrett	73	697	1,609	16,611	1,682	17,308
New Germany SP**	Garrett	422	4,879	3,498	40,571	3,920	45,451
Monocacy NRA	Frederick	91	910	67	651	158	1,561
Gunpowder Falls SP	Baltimore	44	525	32	322	76	847
South Mountain	Washington	58	871	0	0	58	871
Total		1,706	17,308	7,794	86,743	9,500	104,051

*DBH=the diameter of the tree trunk at 4.5 feet above the ground

**Treatments done by Forest Pest Management and Maryland Conservation Corps (Department of Natural Resources)

***Soil treatments done by Broad Creek Boy Scout Camp

Fall 2011 – Spring 2012 Imidacloprid Treatments for Hemlock Woolly Adelgid in Maryland.

Hemlock Woolly Adelgid: Suppression Efficacy

Sixteen hemlock stands have been evaluated for efficacy of HWA treatments with imidacloprid between 2005 and 2012. Treated trees averaged a 77 percent reduction in HWA populations when measured 1 year post treatment, and untreated trees averaged a 20 percent reduction in HWA populations when measured over the same time period. Measurements were based on 3 to 10 treated hemlock trees and 3 to 10 untreated hemlock trees per site; HWA was counted on two to four 30-cm branch tips per tree.

Emerald Ash Borer (EAB)

In conjunction with the MDA-Plant Protection Section, MDA-FPM put up 195 emerald ash borer (*Agrilus planipennis* Fairmaire) purple traps in the EAB-quarantined counties of Maryland that were not designated as of special interest. MDA-FPM traps picked up a new EAB find in Garrett County.

2012 Emerald Ash Borer Traps*	
County	Number of Traps
Baltimore County	35
Baltimore City	15
Harford County	10
Frederick County	30
Carroll County	30
Garrett County	40
Allegany County	15
Washington County	20
Total	195

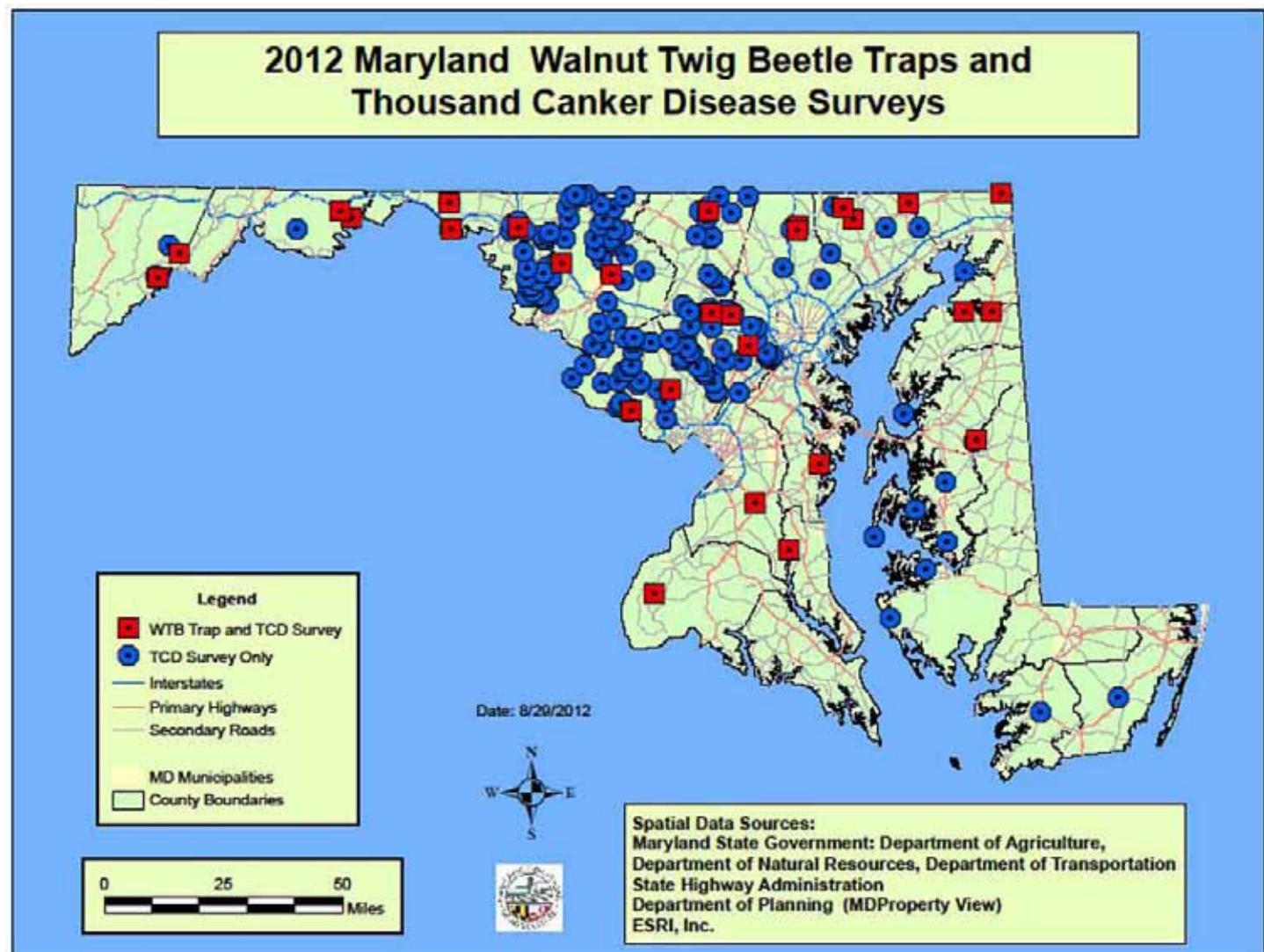
*Number of EAB traps monitored by Forest Pest Management Personnel

Number of Emerald Ash Borer Traps Monitored by Forest Pest Management Personnel by County.

Thousand Cankers Disease (TCD) of Black Walnut and Walnut Twig Beetle (WTB)

Eastern black walnuts planted in the Western United States have experienced dieback and mortality due to thousand cankers disease (*Geosmithia morbida*). The walnut twig beetle (*Pityophthorus juglandis*) spreads TCD. An infested tree usually dies within 3 years of the first appearance of symptoms. This beetle and disease had not been reported in the natural range of the eastern black walnut until they were discovered in Tennessee in 2010. Since then, they have been found in Pennsylvania and Virginia.

MDA-FPM joined other Mid-Atlantic States to start surveying for this disease in 2011. In 2012, MDA-FPM staff visually inspected 206 sites for symptoms of TCD. So far, the disease has not been seen in Maryland. Staff members set 28 traps baited with a pheromone for the WTB statewide. No WTB have been found.

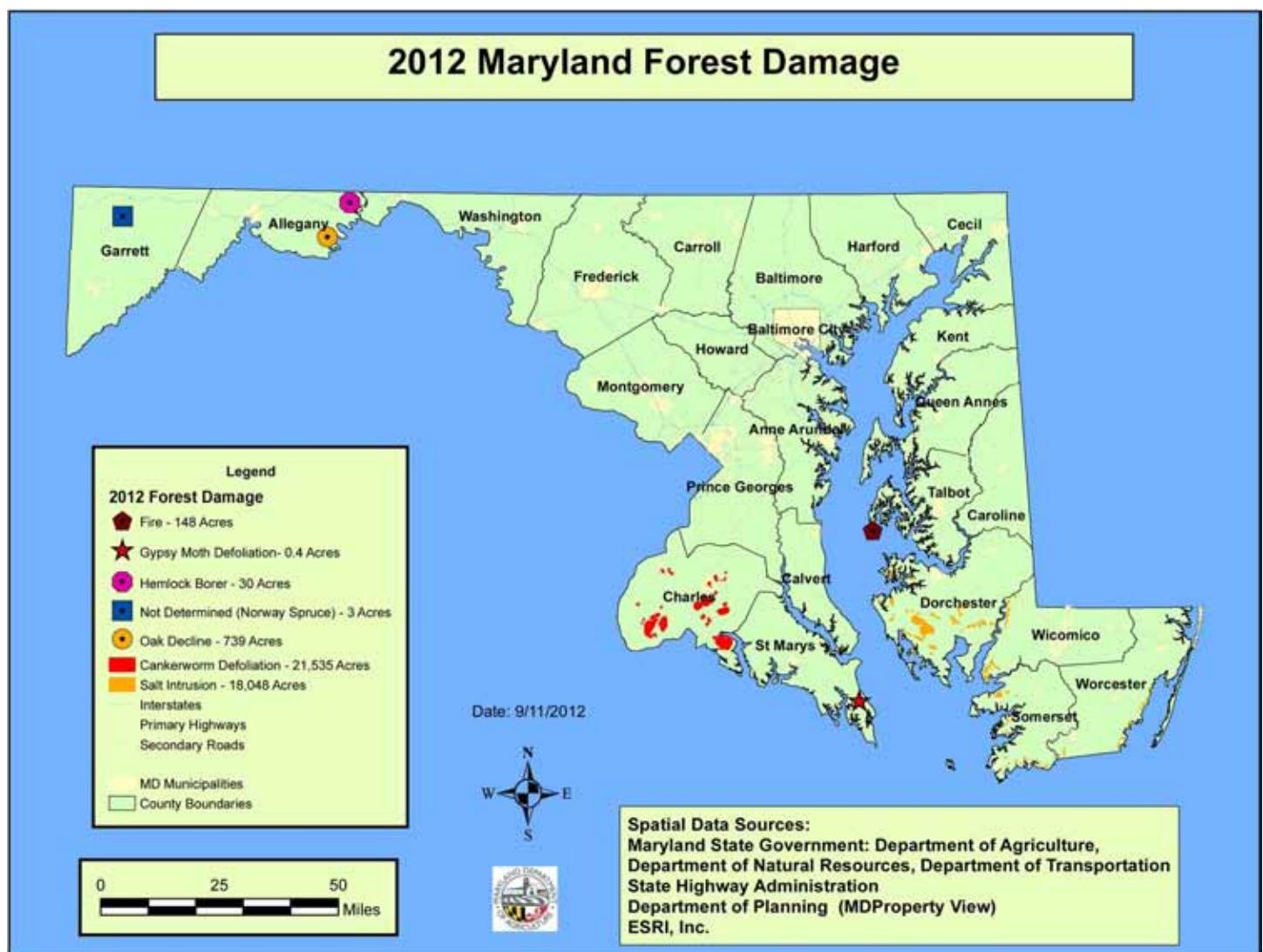


2012 Maryland Walnut Twig Beetle Traps and Thousand Cankers Disease Surveys.

Bacterial Leaf Scorch

Bacterial leaf scorch (*Xylella fastidiosa*) was prevalent all through the State this year. Not only was it observed on ornamental trees, but for the first time it was observed throughout the State in forested areas.

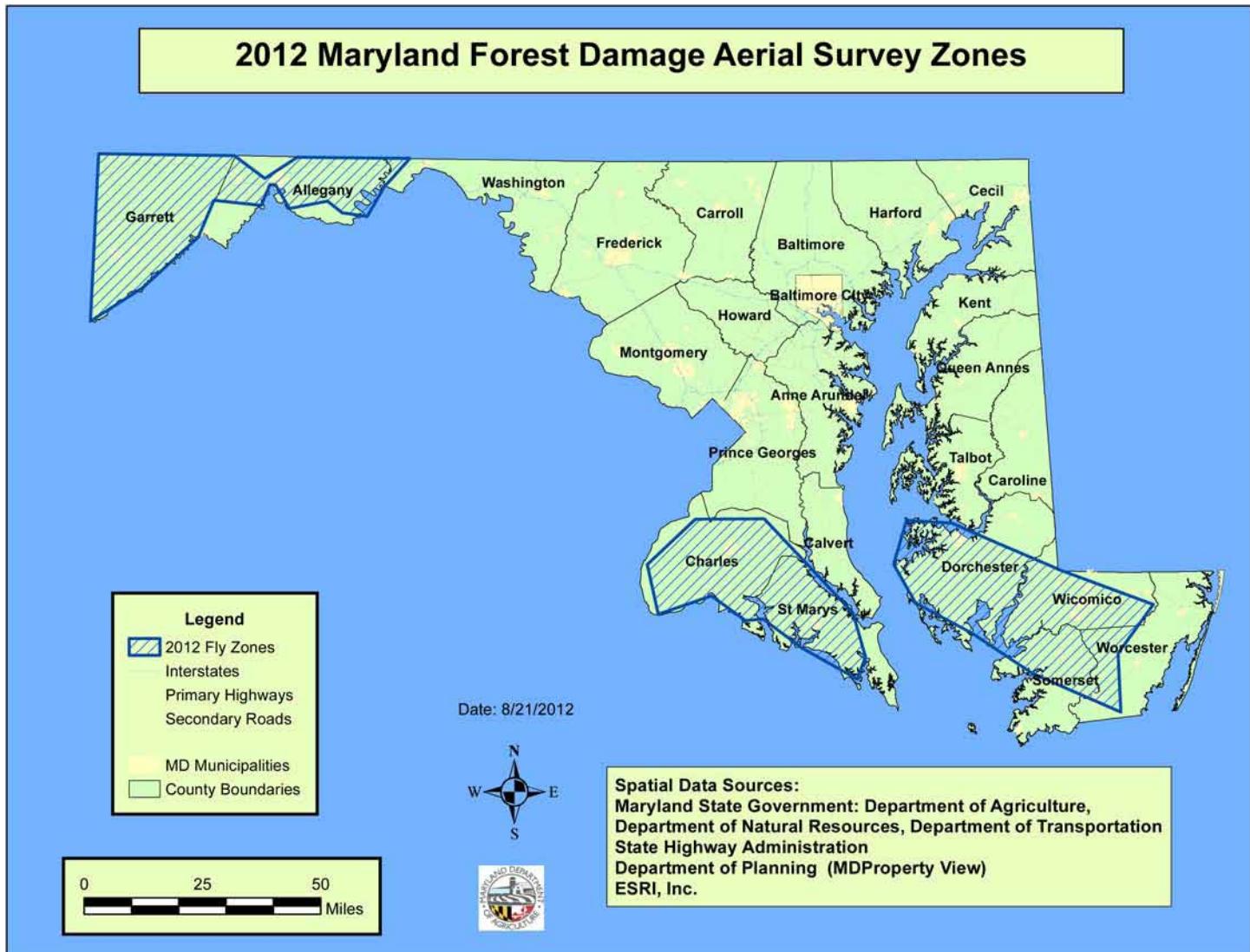
Forest Pest Damage



2012 Maryland Forest Damage.

2012 Aerial Survey Damage Assessment

Garrett, Charles, and St. Mary's Counties were flown to map forest damage. The 2012 aerial survey damage assessment was made to document the results of the gypsy moth suppression in Garrett County and to map defoliation by cankerworms in Charles and St. Mary's Counties. Maryland relied on a new technology called the "Disturbance Mapper." This new method uses satellite imagery to detect changes in forest conditions.



2012 Maryland Forest Damage Aerial Survey Zones.

References

Land Cover Map:

U.S. Geological Survey. 2011. 2006 National land cover dataset. Sioux Falls, SD.

Forest Land Ownership, Forest Species Type:

U.S. Department of Agriculture, Forest Service. 2009. Forest resources of the United States, 2007. Gen. Tech. Rep. WO-78. Washington, DC. 336 p.



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March 2013